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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/567,369

05/15/2006

Noboru Ichinose

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08/19/2008

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EXAMINER

SALERNO, SARAH KATE

ART UNIT

PAPER NUMBER

2814

MAIL DATE

DELIVERY MODE

08/19/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/567,369	<b>Applicant(s)</b> ICHINOSE ET AL.	
	<b>Examiner</b> SARAH K. SALERNO	<b>Art Unit</b> 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 15 May 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>2/7/06</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Specification*

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Udagawa (JP 2000-349336).

Claim 1: Udagawa teaches a semiconductor layer, characterized by comprising:  
a first layer made of a  $\text{Ga}_2\text{O}_3$  system semiconductor (102); and  
a second layer (103) obtained by replacing a part or all of oxygen atoms of the first layer with nitrogen atoms [0023-0026].

Claim 2: Udagawa teaches the second layer is made of a GaN system compound semiconductor [0026]

Claim 3: Udagawa teaches the first layer is a  $\text{Ga}_2\text{O}_3$  system single crystal substrate [0021].

Art Unit: 2814

Claim 4: Udagawa teaches the first layer is made of  $\text{Ga}_2\text{O}_3$ ,  $(\text{In}_x\text{Ga}_{1-x})_2\text{O}_3$  where  $0 \leq x < 1$ ,  $(\text{Al}_x\text{Ga}_{1-x})_2\text{O}_3$  where  $0 \leq x < 1$ ,  $(\text{In}_x\text{Al}_y\text{Ga}_{1-x-y})_2\text{O}_3$  where  $0 \leq x < 1$ ,  $0 \leq y < 1$ , and  $0 \leq x + y < 1$ , or the like, as a main constituent [0025].

Claim 5: Udagawa teaches the second layer is made of  $\text{GaN}$ ,  $\text{In}_z\text{Ga}_{1-z}\text{N}$  where  $0 \leq z < 1$ ,  $\text{Al}_z\text{Ga}_{1-z}\text{N}$  where  $0 \leq z < 1$ ,  $\text{In}_z\text{Al}_p\text{Ga}_{1-z-p}\text{N}$  where  $0 \leq z < 1$ ,  $0 \leq p < 1$ , and  $0 \leq z + p < 1$ , or the like, as a main constituent [0027].

Claim 6: Udagawa teaches a semiconductor layer, characterized by comprising:  
a first layer made of a  $\text{Ga}_2\text{O}_3$  system semiconductor;  
a second layer made of a  $\text{GaN}$  system compound semiconductor and obtained by replacing a part or all of 6 oxygen atoms of the first layer with nitrogen atoms; and  
a third layer made of an  $\text{GaN}$  system epitaxial layer and formed on the second layer [0023-0027].

Claim 7: Udagawa teaches a semiconductor layer, characterized by comprising:  
a first layer made of a  $\text{Ga}_2\text{O}_3$  system semiconductor; and  
a second layer made of a  $\text{GaN}$  system compound semiconductor and formed on the first layer [0023-0026].

Claim 8: Udagawa teaches a semiconductor layer, characterized by comprising:  
a first layer made of a  $\text{Ga}_2\text{O}_3$  system semiconductor;  
a second layer made of a  $\text{GaN}$  system compound semiconductor and formed on the first layer; and  
a third layer made of an  $\text{GaN}$  system epitaxial layer and formed on the second layer [0023-0027].

***Conclusion***

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. "Preparation and structural properties for GaN films grown on Si (111) by annealing" by Yang et al. (IDS reference) reads on claims 1,2,4,5 & 7.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SARAH K. SALERNO whose telephone number is (571)270-1266. The examiner can normally be reached on M-F 8:00-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. K. S./  
Examiner, Art Unit 2814

/Theresa T. Doan/  
Primary Examiner, Art Unit 2814

Application/Control Number: 10/567,369  
Art Unit: 2814

Page 5